

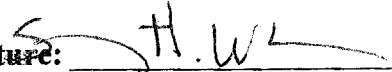
Evaluation of Position Description

Labor Category/FLSA: Nonexempt

 Current Position Description
 X **Proposed Position Description**

Date Prepared: 07/03/03

Approving Official: Name: Sheryl A. Wheeler
Title: HR Specialist

Signature: 

Position Title/Series/Grade: Boiler Plan Operator, WG-5402-10

ORGANIZATION: Division of Property Management

Reference: OPM JGS Boiler Plant Operator, WG-5402, Mar 91; Heating and Boiler Plant Equipment Mechanic Series, WG-5309, 11/92.

TITLE AND SERIES DETERMINATION: This position includes duties which involve the operation and operational maintenance of single and multiple fuel water or fire tube boilers and associated auxiliary and pollution control equipment. These boilers operate at various pressures and temperatures in automatic or manual modes to produce steam or high temperature hot water, to operate industrial and institutional facilities and equipment to generate electricity. The Central Utilities operates and maintains: Five industrial high pressure steam boilers, each producing 150,000 - 200,000 pounds of steam per hour at 165 psi, for a total steam plant capacity of 800,000 pounds of steam per hour; sixteen electrically driven industrial centrifugal refrigeration units of different manufactures utilizing refrigerant 12, 22, or 1392 in sizes from 3000 to 5000 ton capacity each, for a total plant capacity of 68,000 tons and three centrifugal air compressors, with a capacity of 1500 - 3000 CFM each. This industrial equipment is used to supply steam, chilled water and compressed air utility services to over 50 buildings housing a variety of research and medical facilities, a 470 bed research hospital and other administrative buildings located on the NIH reservation. Based on this review, the title and series, Boiler Plant Operator WG-5402 is the appropriate title and series for this position.

GRADE DETERMINATION: Subject job is involved in the operation of automatic high pressure stoker fired and multi-fuel power boilers. This work requires the skill and ability necessary to Start, operate make adjustments, shut down and perform operational maintenance and repairs on boilers and associated equipment. The duties of position requires a comprehensive knowledge of all operational functions of the power boiler plants. The Operator must possess the ability to monitor gages, controls and others indicators and the skill necessary to make adjustments to correct any abnormal readings or pressures. This work would require skills and knowledges and responsibilities that equals the requirements of reference standard at the WG-10 level. Based upon the above evaluations subject job as a WG-5402-10.

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CONCLUSION: In accordance with the classification practices and titling prescribed in the WG-5402 Series standard. The proper classification for subject job is therefore determined to be Boiler Plant Operator, WG-5402-10

Boiler Plant Operator, WG- 5402- 10

Introduction:

The Division of Property Management (DPM) serves all of the NIH Community by providing support for renovations, new construction and maintenance of existing facilities, utilities and grounds. The Division provides professional leadership for the engineering programs of the Department of Health and Human Services, National Institutes of Health (NIH). The scope of DPM operations is such that the effectiveness with which they are carried out has a major and direct effect on the worldwide biomedical research programs of the NIH. In addition to the main facilities at the Bethesda Campus and in Poolesville, MD, NIH has facilities at Research Triangle Park, North Carolina, Rocky Mountain Laboratory in Montana and the Gerontology Research Center in Baltimore, MD.

This position is organizationally located within the DPM in one or more of the subordinate organizational components responsible for the provision of operations and maintenance of NIH facilities. The position is multi-disciplinary and requires the incumbent to be multi-skilled and flexible in the types and complexity of work performed. The position requires that the incumbent be able to work independently and take the initiative to complete the work assigned with a minimum of direct supervision regardless of the nature of the work thus requiring that specific trade skills be shared between staff members.

The Central Utilities operates and maintains: Five industrial high pressure steam boilers, each producing 150,000 - 200,000 pounds of steam per hour at 165 psig., for a total steam plant capacity of 800,000 pounds of steam per hour; sixteen electrically driven industrial centrifugal refrigeration units of different manufactures in sizes from 3000 to 5000 ton capacity each, for a total plant capacity of 68,000 tons and three centrifugal air compressors, with a capacity of 1500 - 3000 CFM each. This industrial equipment is used to supply steam, chilled water and compressed air utility services to over 50 buildings housing a variety of research and medical facilities, a 470 bed research hospital and other administrative buildings located on the NIH reservation.

II. Major Duties:

Incumbent serves at the journeyman level in operation, troubleshooting, minor maintenance and repair of the high pressure boilers, centrifugal, refrigeration units, air compressors, and their associated auxiliary equipment. Incumbent performs a range of duties which requires a basic knowledge of high pressure boiler, centrifugal compressor refrigeration and compressed air systems. Incumbent spends approximately 90 % of time as an operator and 10 % in maintenance responsibilities.

1. As a boiler plant operator on a rotating shift, incumbent starts, operates, adjusts, stops, maintains and performs various operational repairs on any or all the multiple boilers and associated auxiliary and pollution control equipment. These boilers are capable of being fired on No. 2 fuel oil, natural gas or a combination of these fuels to produce high pressure steam to meet constantly changing load.

Observes coordinates and controls operation of 1 or more boilers in the plant. Through the use of pneumatic or micro-processed based controls, the incumbent manually or in automatic mode, maintains efficient combustion levels and ensures compliance with air pollution laws and regulations. Monitors, adjusts, and controls all phases of boiler plant operations. Uses electronic and pneumatic controls and log charts readings, in conjunction with meters, gauges, and computer generated data to determine adjustments or corrections necessary for proper operations or changing load requirements.

Operates and adjusts auxiliary and pollution control equipment such as: forced and induced draft axial fans; centrifugal, reciprocating, diaphragm, and vacuum pumps, condensate de-aerators, steam turbines, heat exchanger, water softeners and bearing cooling water systems. Regularly observes and notes readings on gauges, meters, vibration detectors, recorders, drum level indicators and microprocessor displays to detect danger signals in operations. Check the operation of safety equipment such as flame scanners, purge duration cycle, low water cut-outs, high pressure cut-outs and related alarms. Check for the probability of steam leaks by visual and audible inspections; by applying prescribed test procedures and equipment; and by exploration of the probable reasons for equipment failure.

2. As a air conditioning equipment operator on rotating shifts, incumbent starts, stops, operates, adjusts, and continuously monitors the large electrically and steam driven centrifugal compression refrigeration units and associated auxiliary equipment including cooling towers, chemical feed systems, steam reducing stations etc. Assures the proper chill water temperature for out going and return water at maximum efficiency.

Monitors all pressures and temperatures on the refrigerant, water and oil systems for the unit and takes immediate corrective action when readings are out of range. Make changes to equipment operation without disruption plant operation or proper chilled water supply. Troubleshoots operational problems by locating and checking various elements such as those which control low and high side pressure; the temperature of the refrigeration units; the temperature of the liquid and suction lines; and the running time of the various pieces of equipment.

3. Supports the maintenance and repair of all the mechanical equipment in the plant. Incumbents assist in the disassembly and repair of the basic mechanical machinery, equipment and systems. Performs routine maintenance work on the boilers which includes patching brickwork in boilers, turbinizing tubes, cleaning and inspecting boilers drums, dismantling pumps, turbines, valves, steam traps, steam lines, and water lines.

Uses all tools and instruments of the trade and does maintenance on all auxiliary equipment, boilers, refrigeration equipment, air compressors, etc. Maintains a neat, clean, and orderly work area.

4. Performs a number of tasks which are essential to the operations of the plant. These duties include: Operates and maintains the central compressed air plant consisting of two (2) 1500 CFM and one (1) 3000 CFM centrifugal compressor units and on (1) 400 CFM oil less reciprocating unit. Starts, stops, monitors, and regulates the boiler feed water pump, condensate pump and bearing cooling water systems. Insures proper operating conditions, pressures and temperatures, and switches pumps as necessary to meet plant boiler demands. Test two 300, 000 gallon water softeners and regenerates and adjusts chemicals and water flow when necessary to assure efficiency.

Receives fuel oil into main tanks (two tanks of 529, 000 gallons each) and transfers oil to day tanks and operates necessary equipment to accomplish this. Verifies that proper amount of oil is delivered. Operates numerous sump pumps and various heating and ventilating systems in the plant.

5. Adheres to established plant procedures and complies with all safety precautions. Conducts a complete physical check of plant on a regular basis during shift where all auxiliary equipment is inspected and checked. Remains on the alert to detect malfunctioning equipment and takes necessary steps to prevent equipment stoppage and breakdown.
6. Performs other related duties as assigned.

III. Skills and Knowledge

At this level, incumbents have the skills and knowledge to operate all of the equipment and systems in the refrigeration plant and to operate all of the equipment in the boiler plant.

1. As a boiler plant operator, incumbent applies a comprehensive knowledge of all operational phased of heating boiler plant operations and their interrelationships for efficient and economical generation of high pressure steam, utilizing microprocessor control system.

Knows and understands the principles of high pressure steam generation including heat of evaporating and condensation, heat transfer, conduction, radiation, convention, etc. Is knowledgeable about the theory application of combustion components CO, O₂, H₂O, sulphur, etc. and the proper firing of boilers to get maximum combustion efficiency with minimum air pollution. Can apply various the methods of analysis of stack gases, boilers,

efficiency and corrective measures which should be taken when CO and O₂ are out of proper proportions.

Possesses the skills in the procedures and adjustments necessary to start, stop, adjust and troubleshoot the equipment in the plant to meet load demands and maintain efficient levels of combustion and compliance with air pollution laws. Is familiar with the plant casualty control drills and the correct procedures or actions necessary to avoid a plant shutdown or damage. Is able to read analyze information from numerous gauges, meters, recorders, analog and digital displays, and computer generated data to determine the operational status of the facility and to make any necessary adjustments.

Incumbent is able to perform combustion calculation in order to make adjustments to firebox variable such as fuel flow, fuel/air ration, temperatures, and combustion time to control chemical pollutants in the flue gases, and to maintain combustion efficiency.

Possesses the knowledge and skills to properly operate the various auxiliaries on the steam boilers, such as reciprocating, centrifugal, gear, and rotary pumps, forced and induced draft fans, turbines, bearings, pressure lubricating systems, oil seals, governors, fuel oil heaters, soot blowers, automatic feed water regulators, de-aerators, combustion controls, and numerous other equipment. Has the ability to make proper adjustments to the equipment named, and to diagnose operating problems and make appropriate emergency repairs.

2. As refrigeration plant operator, incumbent understands the principles and theories of compression refrigeration and the related theories and cycles, such as, heat flow through radiation, convection and conduction specific, sensible, latent and total heat; the refrigeration cycle, compressor surging, heat transfer, laws, the use of the refrigeration tables, and the pressure temperature characteristics of a refrigeration system in order to locate faulty equipment swiftly to reduce inoperative time to a minimum.

Possesses and maintains the ability and knowledge to operate the compressors, pumps and cooling tower to provide the desired chilled water temperature in an efficient and effective manner. Has the ability to troubleshoot the unusual equipment malfunctions using numerous testing techniques, gauges, meter and flow instruments. Can quickly and expertly find the source of the problem and determine the nature and extent of repairs or adjustments needed.

Can detect abnormal operating conditions that could seriously damage the unit, and takes immediate corrective action to change or shut down the unit. Understands the function of the centrifugal compressor, evaporator and condenser sections, cooling towers, hot gas bypass, interstage cooler, liquid sub cooling, pumping hydraulics and pumping systems, and how they all operate together to produce chilled water.

IV. Responsibility

The incumbent has responsibility for a variety of different operations and equipment to complete assignments. Determines proper work sequence on equipment involving many components. Work requires a reasonable degree of accuracy and precision when dealing with large boilers and refrigeration equipment.

Receives specific instructions from the foreman and/ or leader and then normally proceeds on own. Work is checked generally for continuity of operation and maintenance of plant equipment and effectiveness of work procedures. Both adherence to prescribed timely reading and recording tasks and quick and appropriate response to emergency situations prevents possible damage to equipment, excessive smoke, or utility outage which could result in a great loss in research effort at NIH.